

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A spark plug comprising:
a tubular housing;
a central bar electrode supported by said tubular housing in said tubular housing with electrical insulation therebetween; and
a ground electrode extending from one end of said tubular housing;
a chip, arranged at an end surface of a base material which is at least one of said central bar electrode and said ground ~~electrode, for electrode, on a side of said one end of said tubular housing, for~~ spark discharge through said central bar electrode and said ground electrode, said chip including a ~~novel metal;~~ noble metal; and
a weld portion between said base material and said chip including first to n^{th} weld layers formed by materials of said chip and said base material by laser welding to fix said chip to said base material, wherein said first to n^{th} weld layers are successively arranged from a side of said base material in order of said first to n^{th} weld layers in a distance increasing direction from said base material which is substantially perpendicular to said end surface, each of said first to n^{th} weld layers has at least an overlap portion with a neighbor of said first to n^{th} weld layers, a sum of a maximum first sectional area of said first layer and second sectional areas of said second to n^{th} weld layers at said overlap portions is 1.4 times a third sectional area of said chip, said first, second, and third sectional areas are along said end surface, and n is a natural number more than one.

2. (Previously presented) A spark plug as claimed in claim 1, wherein an m^{th} weld layer has a maximum fourth sectional area along said end surface which is greater

than said second sectional area of said m^{th} weld layer at said overlap portion between said m^{th} and $(m-1)^{\text{th}}$ weld layer, $2 \leq m \leq n$, and m is a natural number.

3. (original) A spark plug as claimed in claim 1, wherein said chip includes Ir of more than 50% by weight.

4. (Currently presented) A spark plug comprising:
a tubular housing;
a central bar electrode supported by said tubular housing in said tubular housing with electrical insulation therebetween;
a ground electrode extending from one end of said tubular housing;
a stress releasing layer, ~~arranged on a side of said one end of said tubular housing~~ on an end surface of a base material which is at least one of said central bar electrode and said ground electrode;
a chip, being arranged on said stress releasing layer and including ~~a novel metal,~~ noble metal, for spark discharge through said central bar electrode and said ground electrode; and
a weld portion formed between said base material and said chip with materials of said base material, said stress releasing layer, and said chip by laser welding to fix said chip to said base material, wherein a linear expansion coefficient of said stress releasing layer is between those of said base material and said chip, wherein a thickness t of said stress releasing layer is equal to or greater than 0.2 mm and equal to or smaller than 0.6 mm and $\alpha > (1.4 - t) / 2$ where α is a ratio of a maximum sectional area of said weld portion along said end surface to a sectional area of said chip along said end surface.

Claim 5. (Canceled).

6. (Original) A spark plug as claimed in claim 4, wherein said chip includes Ir of more than 50% by weight.

Claim 7. (Canceled).

8. (Currently presented) A spark plug ~~as claimed in claim 4~~ comprising:
a tubular housing;
a central bar electrode supported by said tubular housing in said tubular housing
with electrical insulation therebetween; and
a ground electrode extending from one end of said tubular housing;
a chip, arranged at an end surface of a base material which is at least one of
said central bar electrode and said ground electrode, for electrode for spark discharge
through said central bar electrode and said ground electrode, said chip including a
noble metal; and
a weld portion between said base material and said chip including first to nth
weld layers formed by materials of said chip and said base material by laser welding to
fix said chip to said base material, wherein said first to nth weld layers are successively
arranged from a side of said base material in order of said first to nth weld layers in a
distance increasing direction from said base material which is substantially
perpendicular to said end surface, each of said first to nth weld layers has at least an
overlap portion with a neighbor of said first to nth weld layers, a sum of a maximum
first sectional area of said first layer and second sectional areas of said second to nth
weld layers at said overlap portions is 1.4 times a third sectional area of said chip, said
first, second, and third sectional areas are along said end surface, and n is a natural
number more than one, wherein said weld portion includes first and second ring shape layers, said first layer is arranged between a portion of said end surface of said base material and said stress releasing layer to fix said stress releasing layer to said base material, said second ring shape layer is arranged between said chip and said stress releasing layer to fix said chip to said stress releasing layer.

HORI
Appl. No. 09/919,998
May 25, 2004

Claim 9. (Canceled).

10. (Currently presented) A spark plug as claimed in ~~claim 4~~, claim 8, wherein said weld portion is arranged around said stress releasing layer.

Claims 11, 12, 13 and 14. (Canceled).